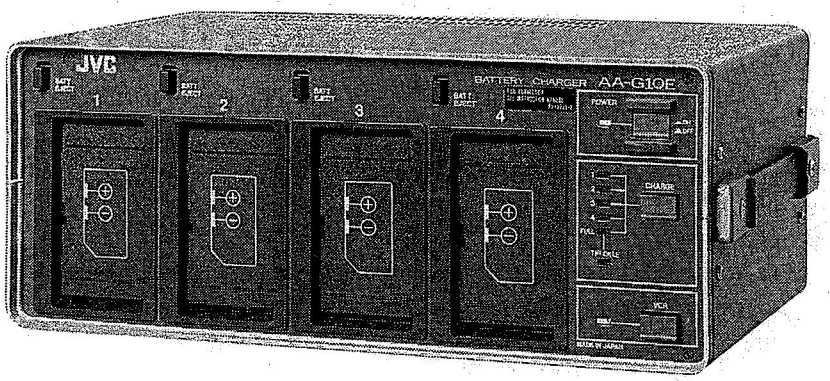
JVC

SERVICE MANUAL

BATTERY CHARGER

AA-G10E(B)



SPECIFICATIONS

Output	:	12 V DC ⎓ , 4 A max.
Charging time	:	Approx. 90 minutes per battery pack
Power supply	:	220 – 240 V AC∿ , 50/60 Hz
Power consumption	:	73 watts
Dimensions	:	327(W) × 135(H) × 203(D) mm
Weight	:	4.5 kg

Design and specifications subject to change without notice.

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No. 9313
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This service manual for the AA-G10E is applicable only to the products whose serial numbers are 6901 and after, which are distinguished into the model "AA-G10E(B)". On using this service manual, make sure of the serial number and the model name "AA-G10E(B)" appearing on the serial number plate on the rear cover.

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Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▒) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.
   Caution for continued protection against fire hazard.
   Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors
   5) Barrier

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

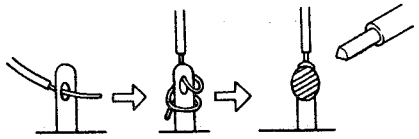


Fig. 1

7. Observe that wires do not contact heat producing parts (heat-sinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10—15 kg of force in any direction will not loosen it.

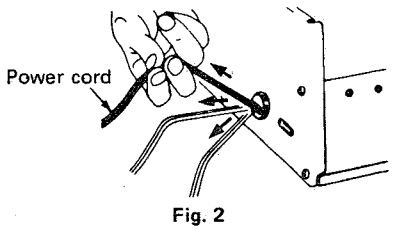


Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

    1) **Connector part number** : E03830-001
    2) **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
    3) **Replacement procedure**
       (1) Remove the old connector by cutting the wires at a point close to the connector.
       Important : Do not reuse a connector (discard it).

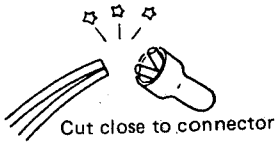


Fig. 3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

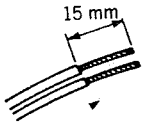


Fig. 4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

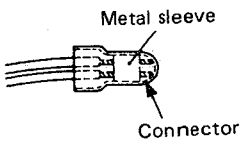


Fig. 5

(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

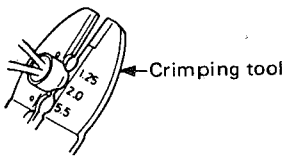


Fig. 6

(5) Check the four points noted in Fig. 7.

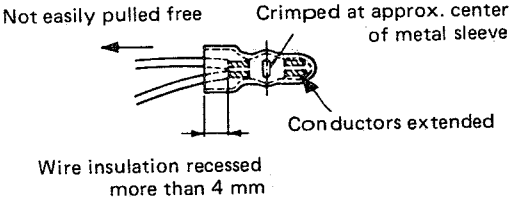

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. Insulation resistance test

Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. Dielectric strength test

Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

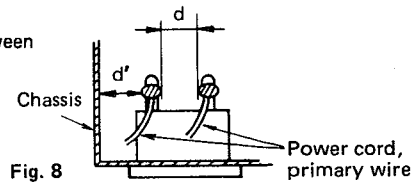


Fig. 8

4. Leakage current test

Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

Measuring Method: (Power ON)

Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

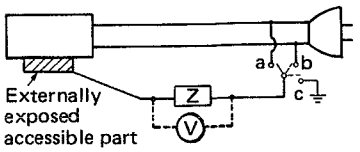


Fig. 9

5. Grounding (Class I model only)

Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).

Measuring Method:

Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

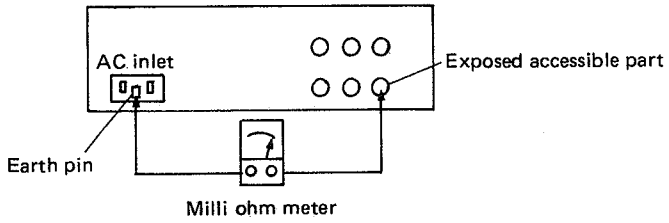


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R≧1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 minute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	–	AC 900 V 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R≧10 MΩ /500 V DC	AC 3 kV 1 minute (Class II) AC 1.5 kV 1 minute (Class I)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	0.15 μF, 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

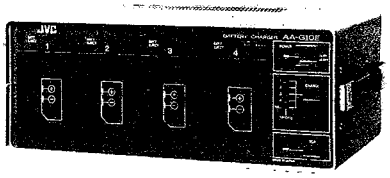
INSTRUCTIONS

JVC

AA-G10E

BATTERY CHARGER

MANUEL D'INSTRUCTIONS: CHARGEUR DE BATTERIE
BEDIENUNGSANLEITUNG: BATTERIE-LADEGERÄT



PGD30002-124-02

WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

Warning Notice
FOR YOUR SAFETY (Australia)

1. Insert this plug only into an effectively earthed three-pin power outlet.
2. If any doubt exists regarding the earthing, consult a qualified electrician.
3. Extension cords, if used, must be three-core correctly wired.

WARNING – THIS APPARATUS MUST BE EARTHED
IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

GREEN-and-YELLOW:	EARTH
BLUE:	NEUTRAL
BROWN:	LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows. The wire which is coloured GREEN-AND-YELLOW must be connected to the terminal in the plug which is marked with the letter E or by the safety earth symbol ⏚ or coloured GREEN or GREEN-AND-YELLOW. The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or which is coloured BLACK. The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

POWER SYSTEM
Connection to the mains supply
The operating voltage of this set is preset to 220 – 240 V~ at the factory.

CAUTION
To prevent electric shock, do not open the cabinet. No user serviceable parts inside. Refer servicing to qualified service personnel.

NOTE:
The rating plate (serial number plate) is on the rear of the unit.

This unit is produced to comply with Directives 76/889/EEC, 82/499/EEC and 87/308/EEC.

Thank you for purchasing the JVC AA-G10E battery charger. To avoid problems and obtain the best results, please read this instruction booklet carefully before use.

Note: The AA-G10E is for use exclusively with the BR-S411E/BR-S422E portable videocassette recorder and NB-G1U battery packs. It will not provide power for any other video recorder, nor will it recharge any other battery pack.

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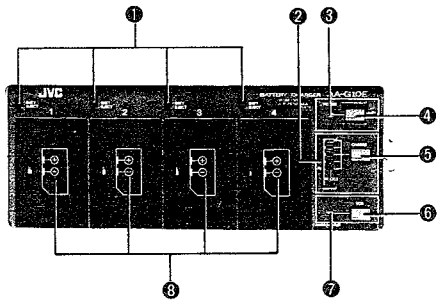
Precautions 2
Controls and connectors 2
To recharge NB-G1U battery packs 4
To supply power to the BR-S411E/BR-S422E portable video cassette recorder 5
Specifications 6

PRECAUTIONS

- Avoid violent shocks and rough handling of the unit.
- Do not allow liquid to spill into the unit.
- Do not insert objects other than the NB-G1U battery packs into the battery compartments.
- Do not place heavy objects on the unit.
- When unplugging power or connection cords, be sure to grasp the plug, not the cord.

CONTROLS AND CONNECTORS

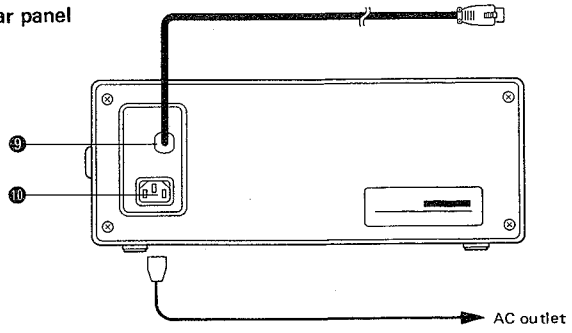
Front panel



❶ Battery eject levers (BATT EJECT)
❷ Charging indicators
The upper 4 LEDs (numbered 1 – 4) light in series to indicate (by corresponding number) which battery pack is currently being charged. When serial charging is completed, the FULL and TRICKLE LEDs light to indicate that trickle (parallel) charging is in progress. After about one hour, the TRICKLE LED goes out and charging is completed.

❸ POWER indicator
Lights when power is switched ON.
❹ POWER button
Activates the AA-G10E to recharge NB-G1U battery packs or to supply power to the BR-S411E/BR-S422E.
❺ CHARGE button
To start charging of NB-G1U battery packs.
❻ VCR button
To convert household AC current to DC power for the BR-S411E/BR-S422E.
❼ VCR indicator
Lights when power is being supplied to the BR-S411E/BR-S422E.
❽ Battery compartments

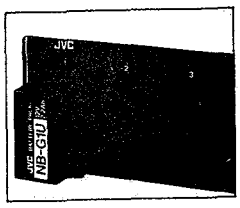
Rear panel



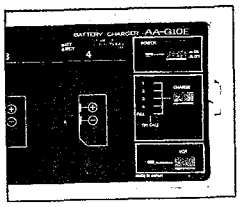
❾ DC OUT cable
To supply power to the DC IN connector of the BR-S411E/BR-S422E.
❿ AC IN connector
For connecting the power cord to provide AC current to the AA-G10E from a household outlet.

TO RECHARGE NB-G1U BATTERY PACKS

The AA-G10E can charge 4 battery packs at a time. Charging is performed one after another, taking about 90 minutes per battery pack. After the 4 battery packs have been charged in sequence, they are charged together in the TRICKLE charging mode for one hour with the TRICKLE and FULL LEDs lit. After completion of charging, the TRICKLE LED goes out.



1. Insert a battery pack into each compartment of the AA-G10E, as illustrated, until it locks into place.



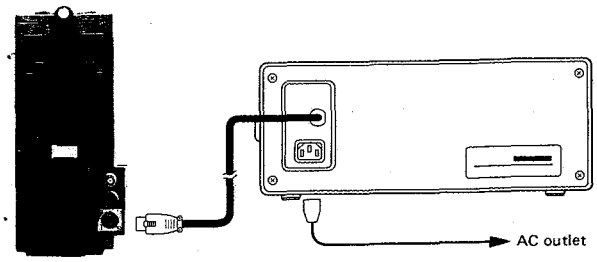
2. Press the POWER button of the AA-G10E to ON (the POWER indicator will light)..
3. Press the CHARGE button, and one charging indicator will light. The FULL indicator lights when charging is completed.

- To remove the battery pack, press the corresponding BATT EJECT lever ❶ .

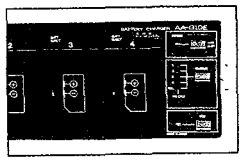
Notes:

- If the BR-S411E/BR-S422E is connected to the AA-G10E, first make sure that the VCR's POWER button is switched OFF.
- If you charge fewer than 4 battery packs, it does not matter which compartments you leave empty.

TO SUPPLY POWER TO THE BR-S411E/BR-S422E PORTABLE VIDEO CASSETTE RECORDER:



1. Connect the DC OUT cable of the AA-G10E to the DC IN connector of the BR-S411E/BR-S422E.
2. Connect the power cord to the AC IN connector of the AA-G10E and plug it into an AC outlet.



3. Press the POWER button of the AA-G10E to ON (the POWER indicator will light).
4. Press the VCR button on the front panel of the AA-G10E (the VCR indicator will light).

Notes:

- If a battery pack remains inside the recorder, its power will be consumed even though power is being supplied by the AA-G10E. Be sure to remove the battery pack during AC operation.

SPECIFICATIONS

Output	: 12 V DC ⎓ , 4 A max.
Charging time	: Approx. 90 minutes per battery pack
Power supply	: 220 – 240 V AC∿, 50/60 Hz
Power consumption	: 73 watts
Dimensions	: 327(W) x 135(H) x 203(D) mm
Weight	: 4.5 kg

Design and specifications subject to change without notice.

SECTION 1
CIRCUIT DESCRIPTION

The AA-G10E multi-charger consists of power-supply board for driving the VCR and charging batteries and a charge control board for selecting between quick charge and trickle charge. See the circuit diagram for the following description.

1.1 REGULATOR BOARD

1.1.1 Input and rectifier circuits

AC input goes to the rectifier circuit via the varistor for absorbing excessive spike noise, and the line filter for preventing high-frequency noise. The rectifier circuit functions as a simple bridge rectifier (220 to 240 V side) or double-voltage rectifier when the CAP HOUSING (P012) is in the OPEN (220 – 240 V) and SHORT (100 – 120 V) respectively. In the latter, the same DC output as 220 to 240 V input is obtained even if the input voltage is 100 to 120.

The PC2 board prevents the breakdown of the transistors before the AC-side fuse F1 opens when the voltage select switch is erroneously set to 220 to 240 V while kept on 100 to 120 V side. Namely, when the voltage applied to thyristor SCR1 exceeds a certain level, it turns on and shorts the rectified output through resistor R1 (43 ohms); fuse F1 then opens to protect the circuit.

1.1.2 Switching regulator

IC1 and Q1 to Q3 constitute a switching regulator circuit, which functions to stabilize the transformer secondary voltage.

Figure 1-1 is a simplified drawing of the Switching regulator circuit. The power stabilized by Q1 and Q3 is supplied to IC1. Part of this generates a reference voltage in the IC, which is sent to pin 9. The voltage generated at the secondary side goes as feedback via photocoupler PTC-1 to the primary side where it is compared with the reference voltage. IC1 contains CR oscillator circuit produces a 20 to 40 kHz pulse which is modulated in width to maintain the output voltage constant. Transformer T1 completely isolates the Q2 final output from the secondary side. The photocoupler provides feedback without electrically connecting the primary and secondary sides.

1.1.3 Secondary side circuit

Two power supply circuits are provided on the secondary side respectively for charging batteries and driving the VCR. The former is a constant-current circuit employing a chopper and the latter is a constant-voltage circuit employing an adjustable zener diode.

In the constant-current circuit R34 adjusts voltage feedback produced by current flow in small resistance R31 (0.05 ohm) so that 1.9A current constantly flows even if the load changes. IC2 performs pulse width modulation similar to IC1. The pulse outputs of Q4 and Q5 are integrated by L7 and C29. R33 adjusts the output voltage for 19 V when 1A current flow to the load. D16 absorbs excessive spike noise generated by switching. Zener voltage of the adjustable zener diode IC3 in the constant-voltage circuit is set by R32. Variation of the output voltage is feedback by the photodiode. The zener diode increases the brightness vs. voltage ratio (sensitivity) of the photodiode.

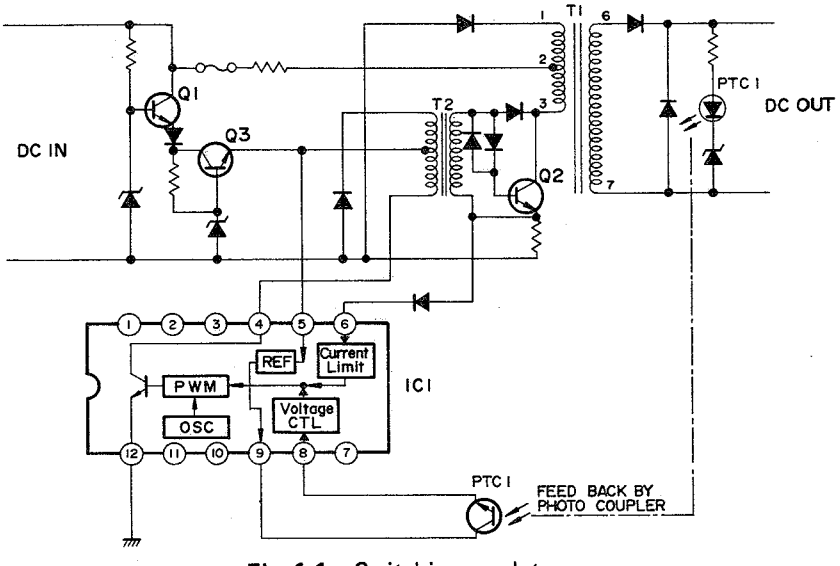


Fig. 1-1 Switching regulator

1.2 CHARGE CONTROL

1.2.1 DC (VCR) mode

LED D8 (VCR mode) turns on when only SW3 of the switch board is set to the R3 side. At this setting, 12 V DC from regulator board connector P014 pin 2 to charge control board connector P022 pin 2 is not obtained from pin 4 (CTL OUT) of P022. Since 12 V DC is absent at regulator board connector P014 pin 4, relay RY1 does not operate. Therefore 19 V charge output is cut off from P014 pin 3, while 12.5 V for driving the VCR appears at pin 3 of P013.

1.2.2 Trickle charge mode

The switch board is set to the normal open (white circle) side, 12 V (CTL OUT) returns to the regulator board via SW3 to operate relay RY1. Therefore, 12.5 V does not flow to the VCR while 19 V charge output is obtained.

At this time P031 pin 1 (OPEN), P023 pin 1 and diode D7 to relay RY5. When Q3 turns on, the oscillator and counter circuits of IC8 start operation with C22, 28, 23 and 24 and R37 serving as time constants. High potential appears at pin 6 of IC8 and low at inverter and driver IC9 pin 11, switching on RY5. 19 V then goes to the batteries in parallel from pin 3 of P022 via the relay contacts. Approximately 6 hours afterwards, IC8 pin 6 returns to low potential to complete charge.

The charge current is not very large due to 15 ohm resistances in series with the batteries.

1.2.3 Quick charge mode

The batteries have three terminals, of which two are interconnected in the batteries. When they are inserted in the charger, the earth line of the charge control circuit connects with the chassis ground and the circuit functions.

Next, the functions when four not-yet-charged batteries are put in the charger will be described. Even if SW1 (QUICK CHG) is turned on by supplying power in this condition, relays RY1 to RY5 all turn off and the cathode voltages of D12 to D15 drop to earth potential. The voltage applied to the input of IC2 window comparator via R16 becomes 0.

D25 is used for protecting the comparator IC2, while D26 forms the input reference voltage of the comparator. This sets the pin 7 of IC2 to the zener voltage, then R22 and R23 divide the zener voltage and apply it to pin 4. If the input voltage to R16 is lower than 5.5 V, high appears at IC2 pin 1 and low at pin 2. However, both pins finally assume low potential because of the open collector IC.

With higher than 18.9 pins 1 and 2 tend to assume low and high potentials respectively. However the open collector finally sets both to low voltage. In other words, the window comparator yields high voltage output when the input voltage is in the range of 5.5 V to 18.9 V, and a low output when outside this range.

Initially (at the moment quick charge is turned on), the input voltage of the window comparator is 0. Therefore output pins 1 and 2 of IC2 are low, pin 13 high, and pin 11 of IC3 low.

All outputs of counter IC5 are initially set to low potential. Therefore IC3 pins 12 and 13 become low and pin 10 high to operate the gated oscillator of IC4.

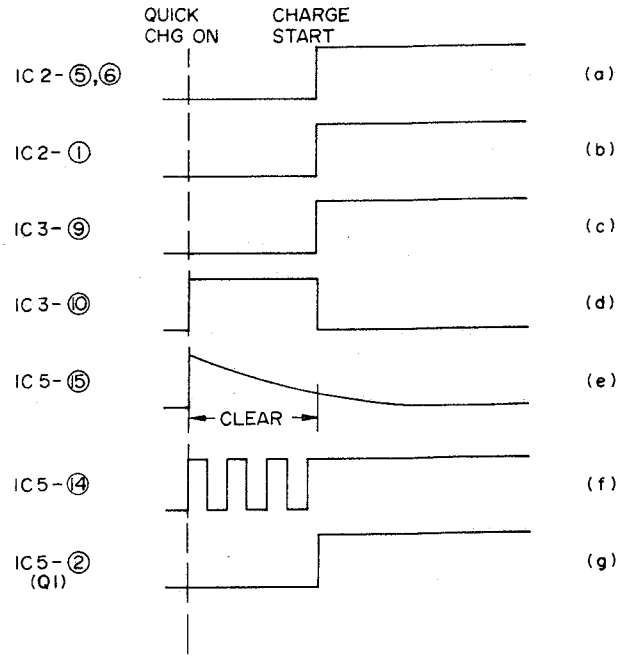


Fig. 1-2 Decade counter output

IC4 produces a continuous 500 msec pulse while pin 10 of IC3 is high, but generates no output when high is applied to the pin 15 CLEAR terminal. The set pulse input to pin 15 has a large time constant as indicated by waveform (e) in Fig. 1-3. Therefore the Q1 output (pin 2) is not produced immediately, but output (H) is obtained several seconds after the input pulse to pin 14. This is inverted by IC9 and operates RY1 to begin charging of the first battery.

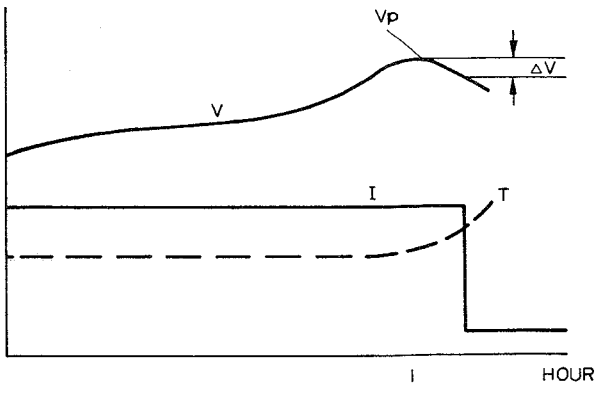


Fig. 1-3 ΔV control

Quick charge of the batteries continues at 1.9 A constant current. When the full charge point is approached, the temperature of the batteries rises quickly due to chemical reaction and the terminal voltage starts falling (see Fig. 1-3).

IC1 of the charge control board is a comparator for detecting this voltage change. Inputs are the terminal voltage of the batteries and the charge stored in capacitor C3. When charging nears maximum, the voltage at one terminal of the comparator starts falling while the other remains at its peak point. The output then becomes high when the difference between the voltages (ΔV) exceeds the threshold point of the comparator. Low potential appears at pin 14 of IC2, and since pins 4 and 5 of IC3 are also low, high potential is reduced at pin 6. This sets IC3 pin 9 low and pin 10 high to trigger the oscillator of IC4. The pulse returns terminal Q1 of counter IC5 to low potential to switch off RY1. Terminal Q2 is at low potential and all relays switch off. The IC2 window comparator produces a low output position for the same reason as the start of quick charge, and the IC4 oscillator operates continuously. The pulse sets IC5 terminal Q2 low and Q3 high, and RY2 operates to begin charging the 2nd battery.

Up to 4 batteries are charged one by one in this manner. Capacitor C3 between IC1 pins 6 and 7 holds the peak voltage and has a large discharge time constant. It is therefore necessary to discharge C3 when proceeding to the next battery. At the start of charging, the voltage of the battery terminals is in the range of 5.5 V to 18.9 V. Therefore the pins 1 and 2 of IC2 window comparator are high and trigger the monostable multivibrator of IC6 (1/2).

Transistor Q2 switches on and transistor Q1 off for 8 seconds. In absence of an input voltage, IC1 automatically discharges C3. The pulse generated by IC6 (1/2) therefore discharges C3 at each change-over of the batteries.

In order to avoid erroneous IC1 output at the moment of the start of charge, the monostable sets pin 4 of IC3 to low potential for 8 seconds.

Quick charge is completed in about one hour. If not completed within this time, IC7 timer operates to switch to the next battery 90 minutes after the start of charge. Upon the completion of charge, the next relay turns on to charge the next battery. In absence of a battery at the next position, the input voltage of window comparator IC2 becomes 19 V. Since this exceeds the upper threshold (18.9 V), pins 1 and 2 of IC2 become low. Oscillator IC4 operates to drive the relay connected to the next battery position.

When charging a battery with terminal voltage less than 5.5 V, IC2 output becomes low for switching to the next battery.

When the 4th battery is finished charging, high appears at terminal Q8 of IC5 and low at pin 9 of IC9, switching transistors Q4 and Q5 on and off respectively. This starts the timer of IC8. Since 12 V is absent from pin 1 of connector P023, transistor Q3 turns off. High potential from IC8 pin 6 sets one side of relay RY5 to low potential for the length of time determined by R37, C23 and C24, i.e., for 60 minutes. Since transistor Q4 turns on, RY5 turns on to connect all four batteries in parallel to continue charging at small current.

SECTION 2
ELECTRICAL ADJUSTMENT

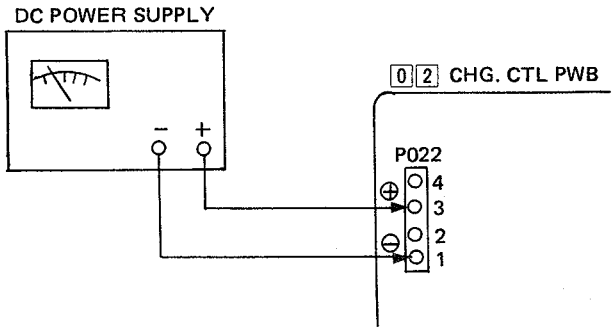
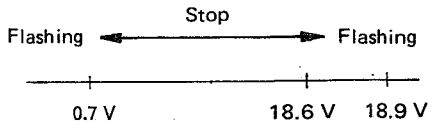
2.1 REGULATOR

Notes: 1. Unless otherwise specified, variable resistors are located on the REGULATOR board.
2. Perform adjustments without battery.

No.	Item	Check point	Adjustment Parts	Mode	Description
1	DC output voltage	DC OUT Connector pin ①–④	R32	VCR	1. Turn the VCR switch on. 2. Connect an ampere meter and *resistor load in series between pins 1 and 4 of the DC OUT connector. 3. Connect a voltmeter to pins 1 and 4 of the DC OUT connector. 4. Adjust R32 (DC OUT VOLT) so that the output voltage becomes 11.67 V when 4 A current flows through the load. *Smaller than 3 ohms.
2	Charge voltage	P0104 pin ①–③	R33	VCR	1. Disconnect connector P014 and short pins 2 and 4 of connector P014 of the REGULATOR board. 2. Connect an amperemeter and a resistor load in series between pins 1 and 3 of connector P014 of the REGULATOR board. 3. Connect a voltmeter to pins 1 and 3 of connector P014. 4. Adjust R33 (CHARGE VOLT) for 19.0 V when 1 A current flows through the load.
3	Const current	P014 pin ①–③	R34	VCR	1. Change the value of the resistor load with the same condition as 2-1-2. 2. Adjust R34 (CURR REG) for 15.0 V when 1.9 ampere current flows through the load.

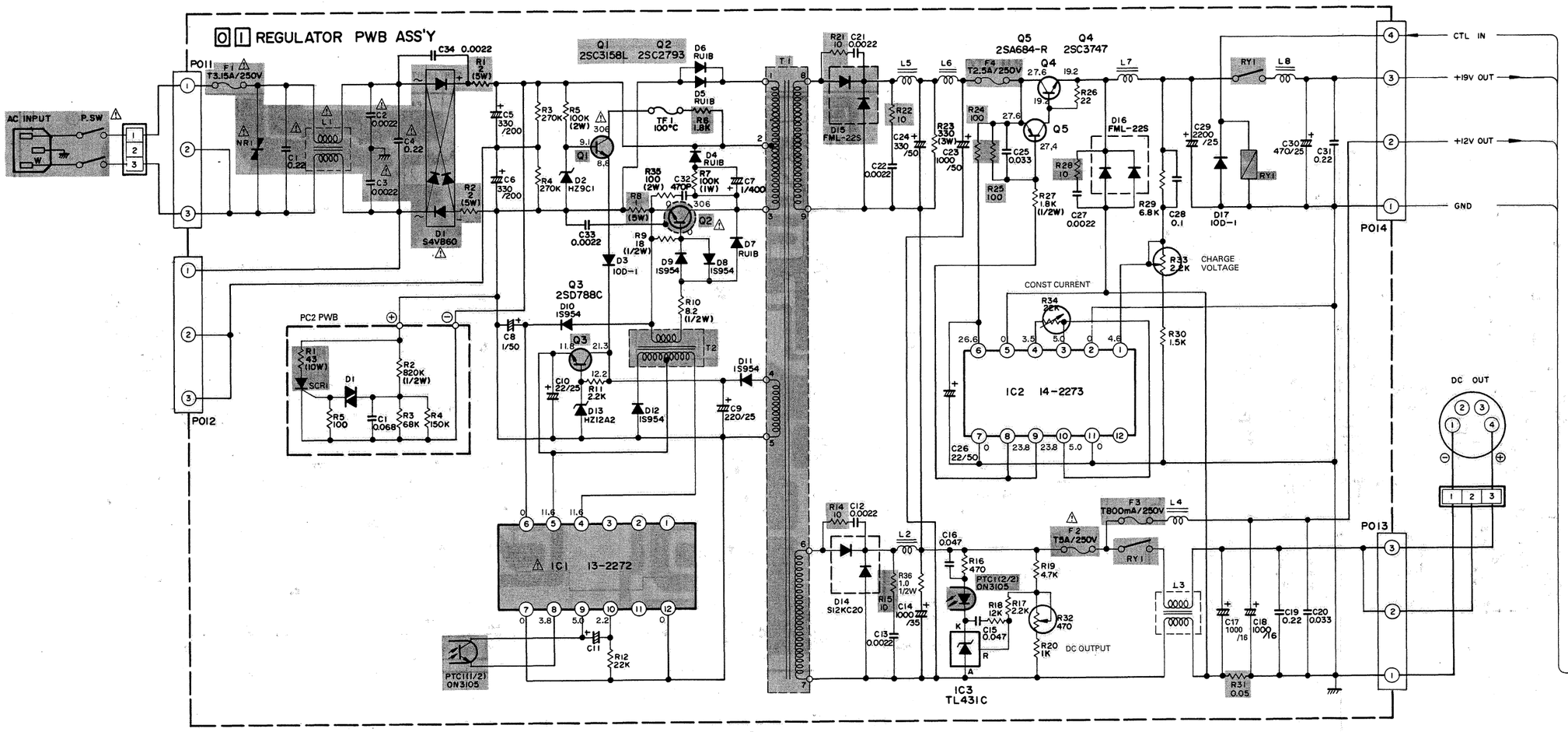
2.2 CHARGE CONTROL

Notes: 1. Unless otherwise specified, test points and variable resistors are located on the CHARGE CONTROL board.
2. Short pins 5 and 6 of connector P021.
3. The REGULATOR circuit should be precisely adjusted in advance.
4. Perform adjustments without battery.

No.	Item	Check Point	Adjustment Parts	Mode	Description
1	Clock frequency	LED D2 – D5 IC4 pin ⑥	R17 R7	(QUICK) CHARGE	1. Set for the (QUICK) CHARGE mode and make sure that LEDs D2 to D5 turn on sequentially. If not, turn R17 clockwise to do so. 2. Connect oscilloscope to pin 6 of IC4. 3. Adjust R7 (CLOCK FREQ) so that LEDs remain on for 500 ± 10 msec. t = 500 ± 10 msec **Fig. 2-1**
2	Comparator voltage	LED D2 – D5	R17	(QUICK) CHARGE	1. Disconnect connector P022 and supply DC voltage externally to pin 3 of connector P022 of the CHARGE CONTROL board, and set for 18.6 ± 0.1 V DC. 2. Turn R17 (COMP VOLT) gradually counter-clockwise and set to the point where LEDs D2 to D5 just stop flashing. 3. Increase the external DC voltage to 18.9 ± 0.1 and confirm that the LEDs start flashing. 4. Decrease the external DC voltage to 0.7 $^{+0\ V}_{-0.1\ V}$ and confirm that the LEDs start flashing again.   **Fig. 2-2**
3	Reset delay	IC6 pin ⑪ IC6 pin ⑩	R12	(QUICK) CHARGE	1. Adjust the external DC voltage to 18.0 V. 2. Press the (QUICK) CHARGE button and adjust R12 (RESET DELAY) so that the time, from when pin 11 to IC6 turns high to when pin 10 of IC6 turns low, becomes 8 ± 0.1 sec.
4	Output delay	IC6 pin ④ IC6 pin ⑥	R15	(QUICK) CHARGE	1. Press the (QUICK) CHARGE button under the same condition as 2-2-3. Reset delay. 2. Adjust R15 (OUTPUT DELAY) so that the time, from when pin 4 of IC6 turns high to when pin 6 of IC6 turns low, beocmes 8 ± 0.1 sec.

No.	Item	Check Point	Adjustment Parts	Mode	Description
5	90 min. timer	IC7 pin ⑤	R30	(QUICK) CHARGE	1. Press the (QUICK) CHARGE button under the same condition as 2-2-3. Reset delay and turn D2 (BATT-1 LED) on. 2. Adjust R30 (90 MIN TIMER) so that time base of oscillation at pin 5 of IC7 becomes 330 ± 1 msec.
6	60 min. timer	IC8 pin ⑤	R37	(QUICK) CHARGE	1. Adjust the external DC voltage to 19.0 V. 2. Press the (QUICK) CHARGE button and turn both D6 (FULL LED) and D7 (NORM CHARGE) on. 3. Adjust R37 (60 MIN TIMER) so that time base of oscillation at pin 5 of IC8 becomes 220 ± 1 msec.
7	PEAK DETECTION	D2 (BATT-1LED) D3 (BATT-2LED)	—	(QUICK) CHARGE	1. Connect the DC power supply as same as 2-2-2. Apply DC 18.3 V to the connector P022 -3 pin. 2. Press the (QUICK) CHARGE button and turn D2 (BATT-1 LED) on. 3. After 5 MIN. set the DC at P022- 3 pin for 18.0 V. 4. Conform that the D2 turns off and the D3 turns on with in 15 sec.

3.1 SCHEMATIC DIAGRAM

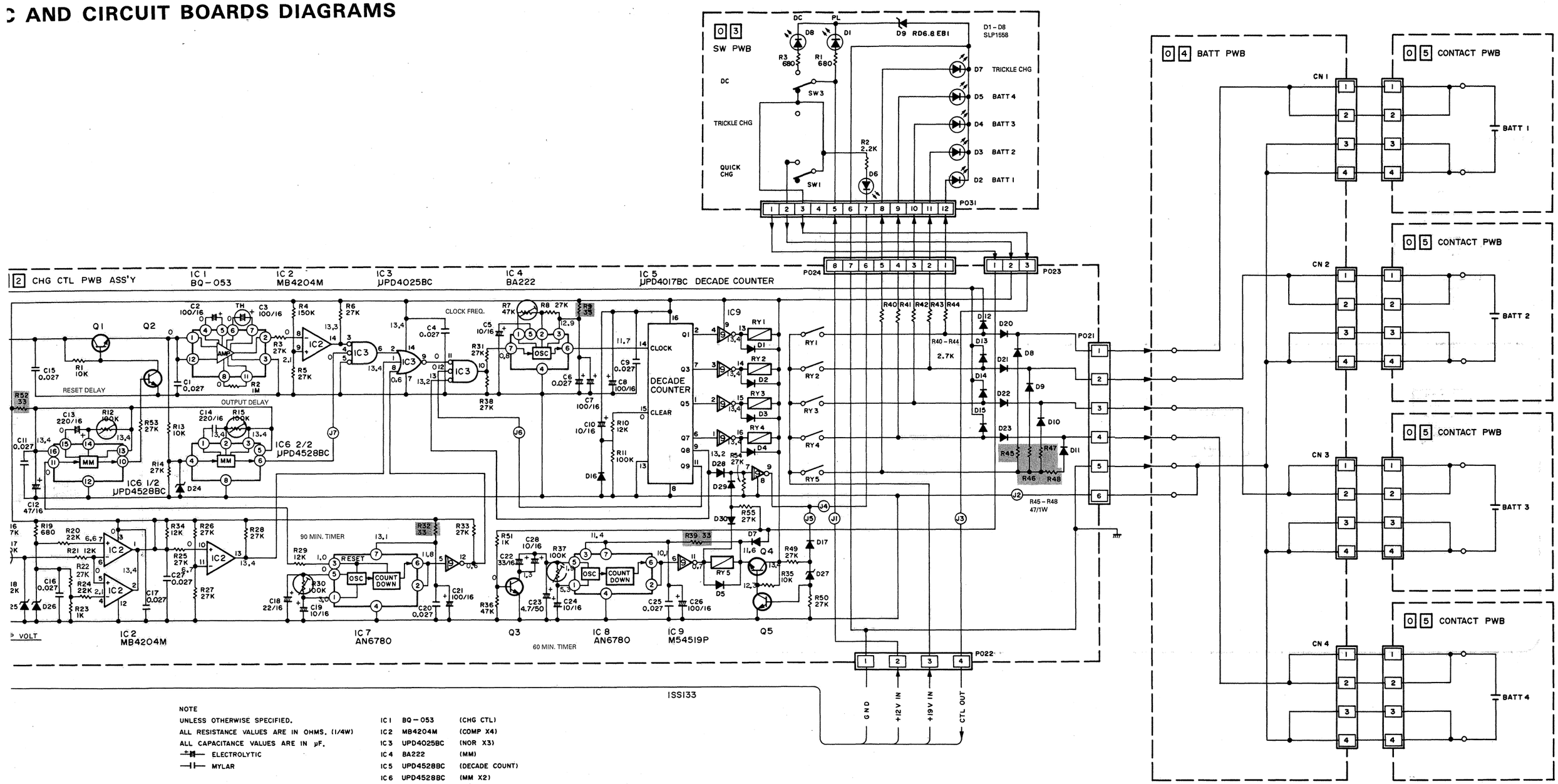


NOTES: Unless otherwise specified.

1. All resistance values are in ohms. (1/4 W)
2. All capacitance values are in μF.
   ⊣⊢ Electrolytic
   ⊣|⊢ Mylar
3. The components identified by the ⚠ symbol and shading are critical for safety. For continued safety replace safety critical components only with manufactures recommended parts.

NOTE: 1. Voltages are DC measured with a digital voltmeter during STOP mode for BR-S422E and VIDEO OPERATE mode for AA-G10E(B).

SECTION 3
C AND CIRCUIT BOARDS DIAGRAMS



NOTE

UNLESS OTHERWISE SPECIFIED.
ALL RESISTANCE VALUES ARE IN OHMS. (1/4W)
ALL CAPACITANCE VALUES ARE IN μF.
⊣⊢ ELECTROLYTIC
⊣|⊢ MYLAR

IC 1	BQ-053	(CHG CTL)
IC 2	MB4204M	(COMP X4)
IC 3	UPD4025BC	(NOR X3)
IC 4	BA222	(MM)
IC 5	UPD4528BC	(DECADE COUNT)
IC 6	UPD4528BC	(MM X2)
IC 7	AN6780	(TIMER)
IC 8	AN6780	(TIMER)
IC 9	M54519P	(DRIVER X7)

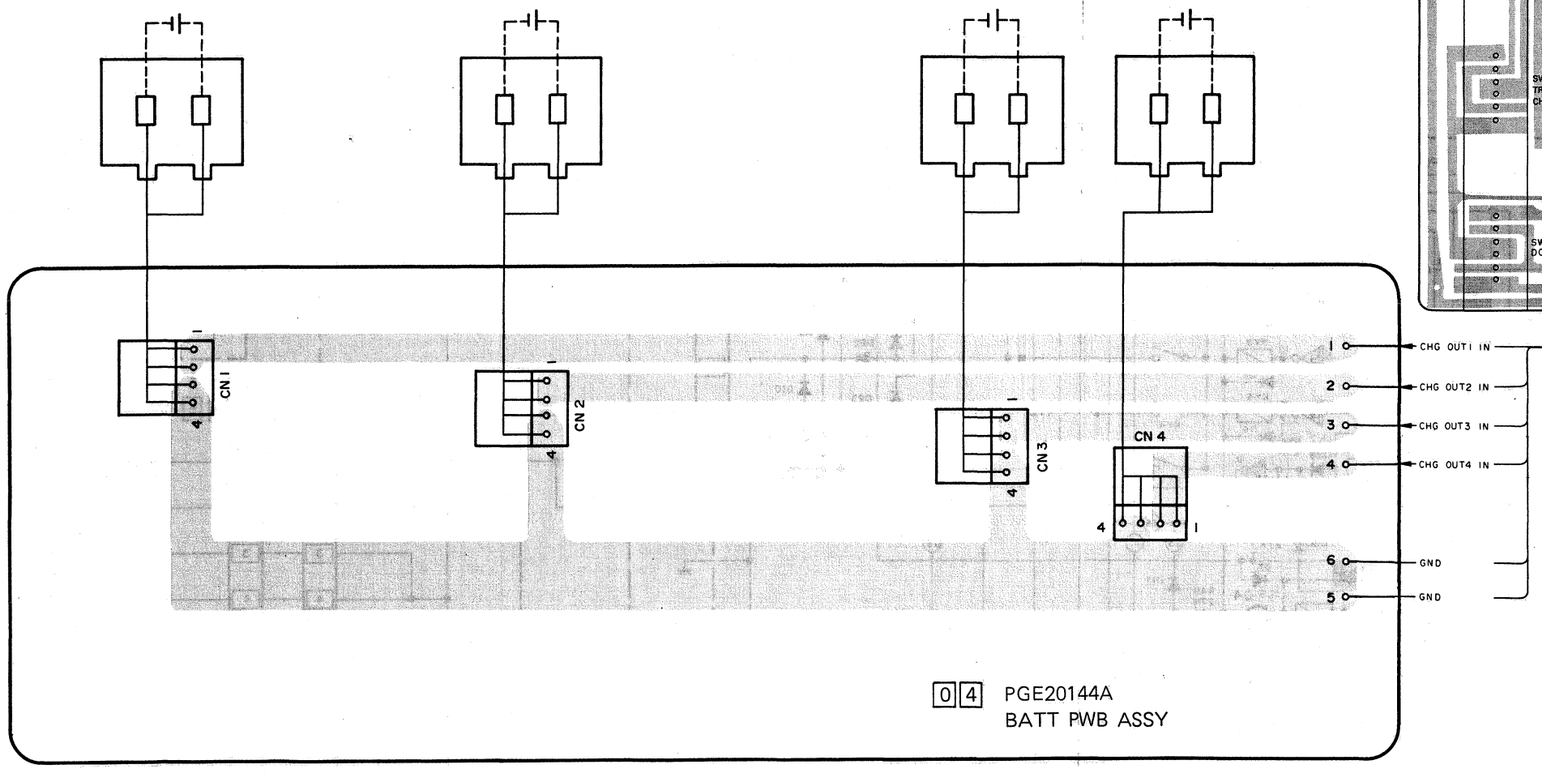
D1 - D5, D7 - D11	10E2
D12 - D17, D28 - D30	1S2473
D20 - D23	U05B
D24 , D25	RD12EB1
D26 , D27	RD6.8EB1

Q1 - Q5	2SD637R

3.2 CIRCUIT BOARDS

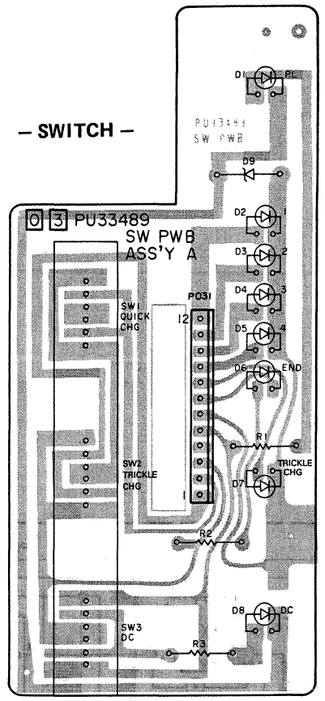
– BATTERY –

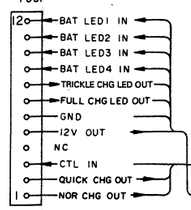
05 CONTACT BOARD ASSY

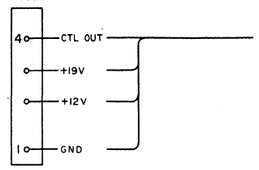


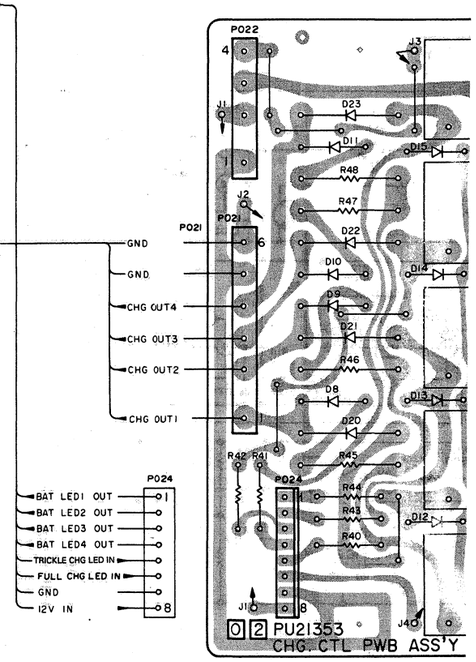
04 PGE20144A
BATT PWB ASSY

– SWITCH –









CTL OUT
+19V
+12V
GND

TRICKLE CHG IN
QUICK CHG IN
CTL OUT
P023

– CHG. CTL –

CLOCK FREQ
90M TIMER

RESET DELAY
OUT DELAY
COMP VOLT
60M TIMER

PU21353
CHG. CTL PWB ASS'Y A B C

– REGULATOR –

19V ADJ.
CUR. LIMIT
01 REG PWB
PTC1
P011
P012
P013
P014
12V ADJ.
CTL IN
+19V IN
+12V IN
GND

PC 2
SCR1

H | I | J | K | 3-2 | 3-2 | M | N | O

SECTION 4
EXPLODED VIEWS AND PARTS LIST

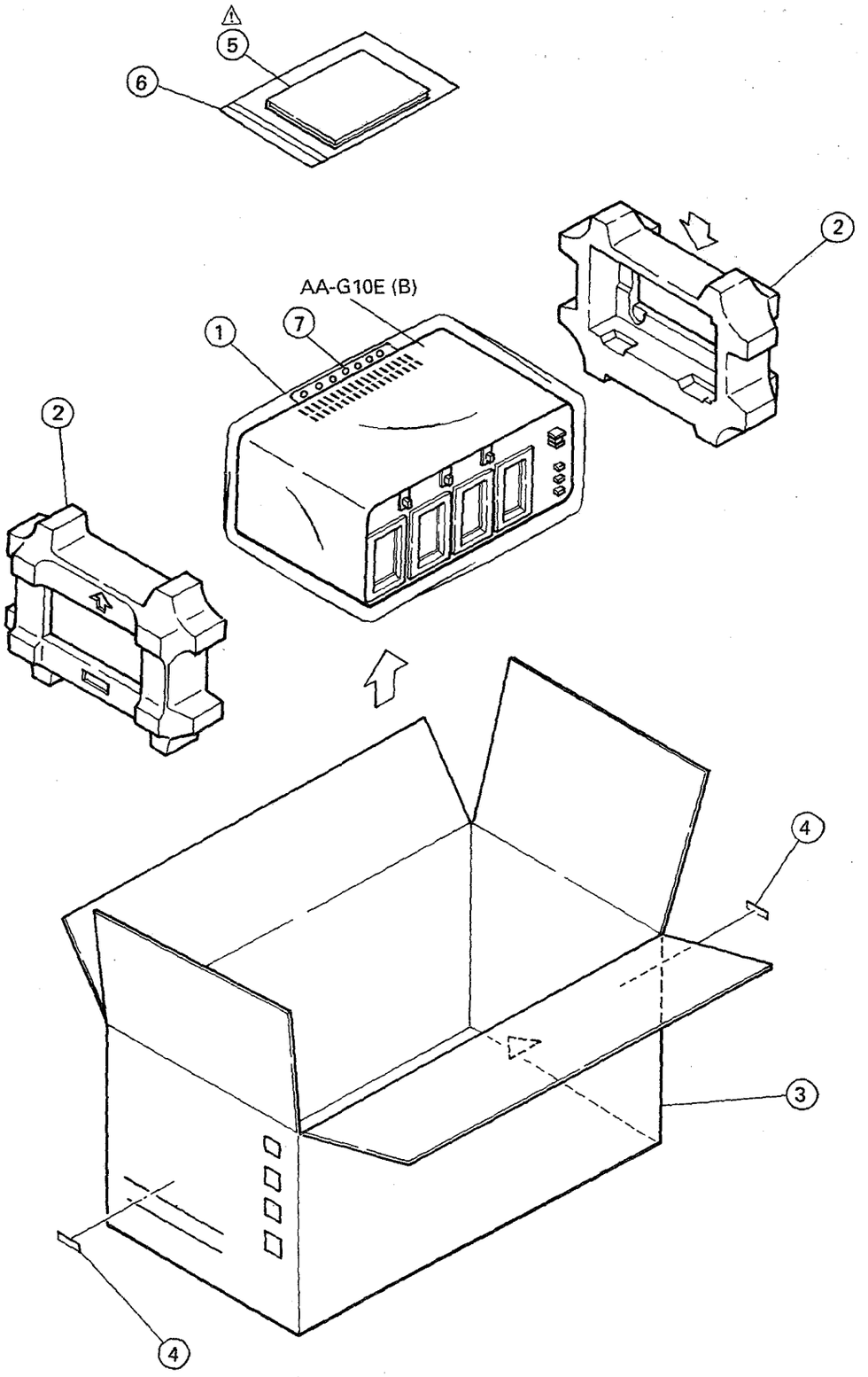
SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety.
Replace only with specified part numbers.

CONTENTS

		Page
4.1	PACKING ASSEMBLY	4 - 2
4.2	CABINET ASSEMBLY	4 - 4
4.3	CHASSIS ASSEMBLY	4 - 6

4.1 PACKING ASSEMBLY <M1>

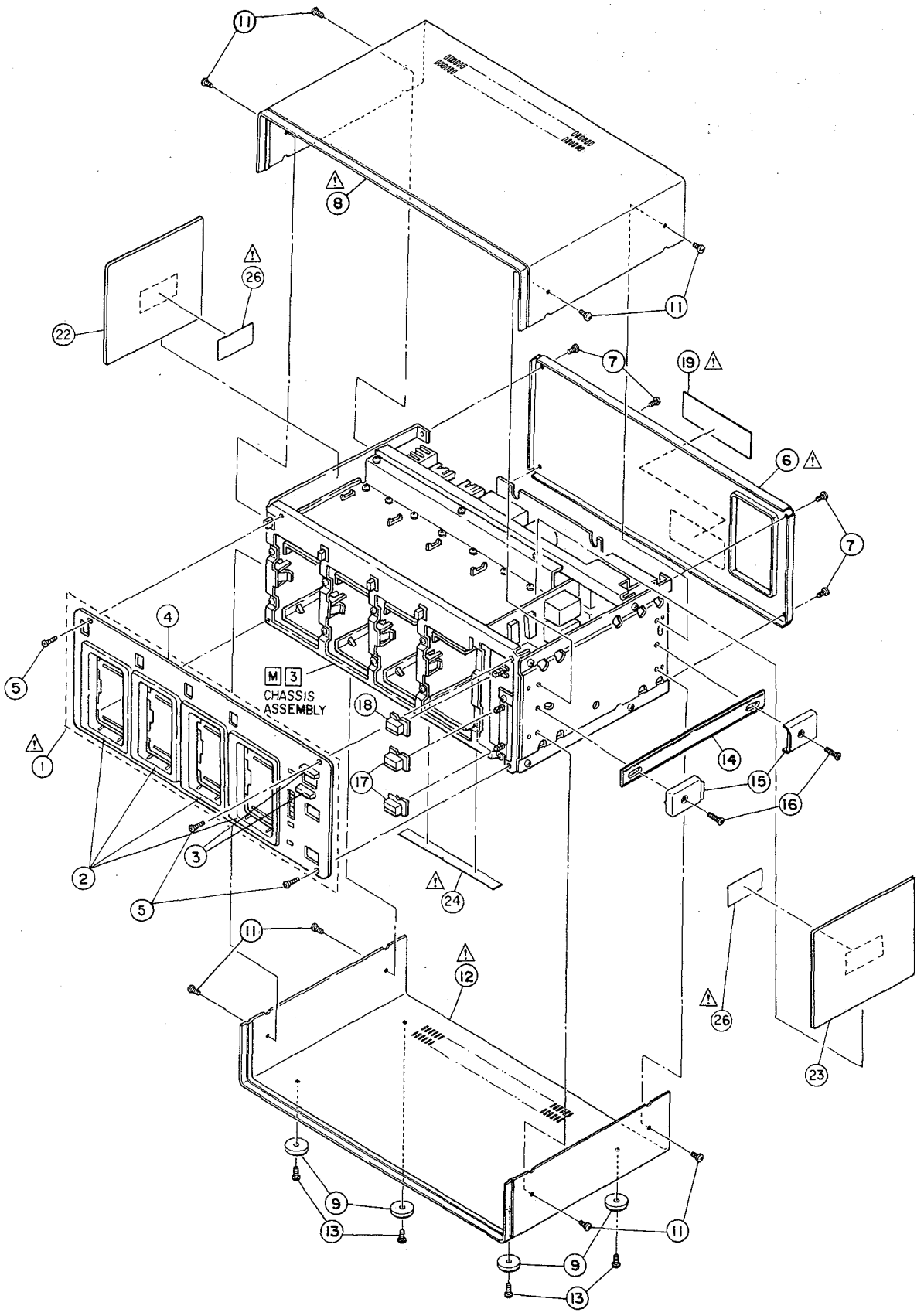


● **Packing assembly list** M 1

M 1 M M

Symbol No.	Part No.	Part Name	Description	Q'ty
1	PRD30077-10	Poly Bag		1
2	PUP20312-02	Cushion		2
3	PGD20193-04-02	Packing Case		1
4	PUP40329	Serial No. Sticker		2
⚠ 5	PGD30002-124-02	Instructions		1
6	QPGB017-02404	Poly Bag		1
7	PRD30413-12-07	Air Cap Bag	For DC Cord	1

4.2 CABINET ASSEMBLY <M2>

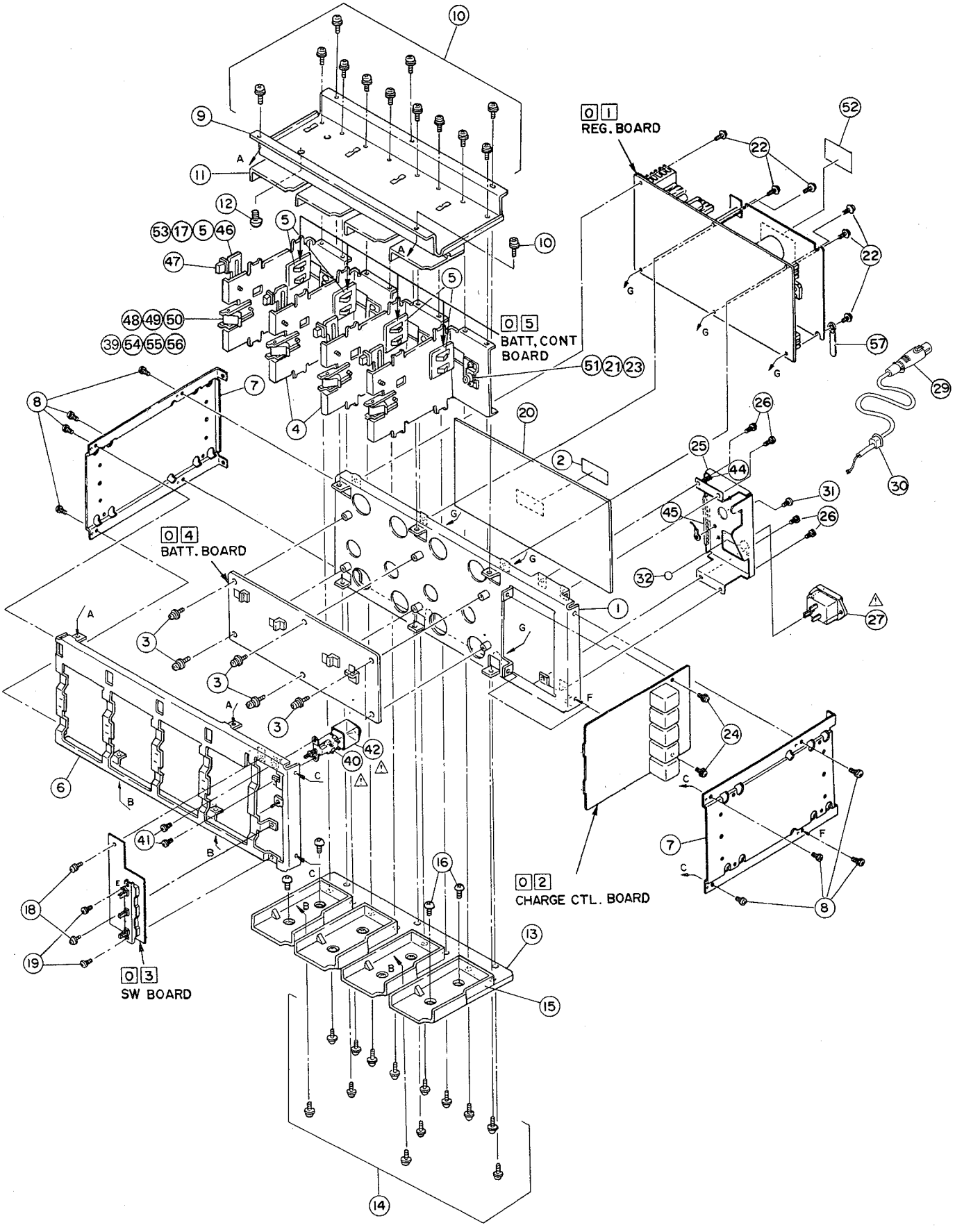


● **Cabinet assembly list** M 2

M 2 M M

Symbol No.	Part No.	Part Name	Description	Q'ty
⚠ 1	PGD202150-05	Front Panel Ass'y		1
2	PGD30424A-03	Battery Escutcheon Ass'y		4
3	PGD40243	Knob Guard		2
4	PGD20192-04-06	Front Panel		1
5	SDSP2606M	Screw		3
⚠ 6	PU33394-03-06	Rear Cover		1
7	SDSP3006M	Screw		4
⚠ 8	PU21311-01-05	Top Cover		1
9	QZF2008-002	Foot		4
10	—			
11	SDSP3005R	Screw		8
⚠ 12	PU21312-01-06	Bottom Cover		1
13	SDST3006M	Tapping Screw		4
14	PU46361-5	Handle		1
15	PRD43812	Handle Cover		2
16	SHSP4012R	Screw		2
17	PU52480-2-2	Push Knob		2
18	PU52480-1-2	Push Knob		1
⚠ 19	PRD30085-46	Serial No. Plate		1
20	—			
21	—			
22	PRD44372	Insulator		1
23	PRD44372	Insulator		1
⚠ 24	PU58760	Label	CAUTION LABEL	2
25	—			
⚠ 26	PU54551	Caution Label	BARIER	2

4.3 CHASSIS ASSEMBLY <M3>



● **Chassis assembly list** M3

M3MM□□□□

Symbol No.	Part No.	Part Name	Description	Q'ty
1	PU21310-02	Chassis Ass'y		1
2	PU54551	Caution Label		1
3	DPSP3006Z	Screw		6
4	PGD30423	Bracket		4
5	—	Batt Cont Board	See Section 4, 5	4
6	PGD20191-01-01	Front Frame		1
7	PU33395-1-3	Side Frame		2
8	LPSP3006Z	Screw		8
9	PGD20194-01-01	Battery Frame (A)		1
10	LPSP3006Z	Screw		13
11	PGD30421-01-01	Battery Holder (A)		4
12	SDSP3005M	Screw		8
13	PGD20195-01-01	Battery Frame (B)		1
14	LPSP3006Z	Screw		13
15	PGD30422-01-01	Battery Holder (B)		4
16	SDSP3005M	Screw		8
17	PGD40825	Collar		4
18	DPSP3006Z	Screw		2
19	LPSP3006Z	Screw		2
20	PRD44373	Insulator		1
21	PU52486-1-1	Spring Holder		4
22	DPSP3010Z	Screw		6
23	DPSP30006Z	Screw		8
24	DPSP30006Z	Screw		2
25	PRD31079-03	Connector Panel		1
26	LPSP3006Z	Screw		4
⚠ 27	PGZ01945	AC Inlet		1
28	—			
29	PGZ02093	DC Cord Ass'y	DC OUT	1
30	QHS6374-162	Strain Relief		1
31	DPSP4008Z	Screw		1
32	PU44457	Sticker		1
33	—			
34	—			
35	—			
36	—			
37	—			
38	—			
39	PGD3003-2	Tension Spring		4
⚠ 40	QSP2111-011	Push Switch	POWER	1
41	LPSP3006Z	Screw		2
⚠ 42	PU49885	Switch Cover		1
43	—			
44	PU43135-1-20	Nylon Grommet		1
45	PU43135-1-95	Nylon Grommet		1
46	PGD40823	Lever		4
47	PGD40826	Push Knob		4
48	PGD40827	Shaft Bracket		4
49	PGD40828-01-01	Hook		4
50	PGD40885	Torsion Spring		4
51	PGD40833-02	Corn Spring		4
52	PRD44397	Label		
53	LPSP3008Z	Screw		4
54	PGD40830	Shaft		4
55	REE1500	E Washer		8
56	LPSP3006Z	Screw		4
57	PU49485-2	Wire Clamp		1

SECTION 5
ELECTRICAL PARTS LIST

1. SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

2. Abbreviations in this list are as follows:

RESISTORS – All resistance values are in ohms (Ω).

K	:	1 000
M	:	1 000 000
CR	:	Carbon Resistor
Comp. R	:	Composition Resistor
WR	:	Wire Wound Resistor
OMR	:	Oxide Metal Film Resistor
VR	:	Variable Resistor (Potentiometer)
MFR	:	Metal Film Resistor
FR	:	Fusible Resistor

CAPACITORS – All capacitance values are in μF, unless otherwise indicated.

P	:	μμF
C Cap	:	Ceramic Capacitor
E Cap	:	Electrolytic Capacitor
FM Cap	:	Film Mica Capacitor
MM Cap	:	Metalized Mylar Capacitor
MP Cap	:	Metalized Paper Capacitor
MY Cap	:	Mylar Capacitor
NP Cap	:	Non-polar Capacitor
PC Cap	:	Polycarbonate Capacitor
PP Cap	:	Poly Pro Capacitor
PS Cap	:	Polystyrol Capacitor
T Cap	:	Tantalum Capacitor
TR Cap	:	Trimmer Capacitor

Tolerances of resistors or capacitors are as follows:

M	:	± 20%
K	:	± 10%
J	:	± 5%
G	:	± 2%
F	:	± 1%

5.1 Regulator Board Ass'y [0][1] PU52801D-05

Symbol No.	Part No.	Part Name	Description
PC-1	PU52801-113	Circuit Board	
⚠IC 1	13-2272	Integrated Circuit	
IC 2	14-2273	"	
IC 3	TL431C	TEXAS	or μA431AWC L5431
⚠Q 1	2SC3158-L	Transistor	NEC
⚠Q 2	2SC3783	"	TOSHIBA
⚠Q 3	2SD1207	"	SANYO
Q 4	2SC3747	"	SANYO
Q 5	2SB892	"	SANYO
⚠D 1	S4VB60	Diode	SINDENGEN
D 2	HZ9C1	Zener Diode	HITACHI
D 3	10D-1	Diode	JAPAN INTER
D 4	RU1B	"	or SM-1XH08
D 5	"	"	SANKEN
D 6	"	"	SANKEN
D 7	"	"	SANKEN
D 8	1S954	"	or DS446 NEC
D 9	"	"	NEC
D10	"	"	NEC
D11	"	"	NEC
D12	"	"	NEC
D13	HZ12A2	Zener Diode	HITACHI
D14	S12KC20	Diode	
⚠D15	FML-22S	"	or D5LCA20
D16	"	"	or D5LCA20
D17	10D-1	"	SANKEN
⚠R 1	PU52801-101	Unflammable R	2
⚠R 2	" -101	"	2
R 3	QRD141J-274	CR	270 K 1/4W
R 4	" -274	"	270 K 1/4W
R 5	PU52801-005	MFR	100 K
⚠R 6	" -040	FR	1.8 K
R 7	" -102	MFR	100 K
⚠R 8	" -007	Unflammable R	1
R 9	QRD121J-180	CR	18 1/2W
R10	" -082	"	8.2 1/2W
R11	QRD141J-222	"	2.2 K 1/4W
R12	" -223	"	22 K 1/4W
R13	—	—	
⚠R14	PU52801-042	FR	10
⚠R15	" -042	"	10
R16	QRD141J-102	CR	1 K 1/4W
R17	" -222	"	2.2 K 1/4W
R18	" -123	"	12 K 1/4W
R19	" -472	"	4.7 K 1/4W
R20	" -102	"	1 K 1/4W
⚠R21	PU52801-042	FR	10
⚠R22	" -042	"	10
R23	" -008	MFR	330
⚠R24	" -103	FR	100
⚠R25	" -103	"	100
R26	QRD141J-220	CR	22 1/4W
R27	QRD121J-182	"	1.8 K 1/2W

Symbol No.	Part No.	Part Name	Description
⚠R28	PU52801-042	FR	10
R29	QRD141J-682	CR	6.8 K 1/4W
R30	" -152	"	1.5 K 1/4W
⚠R31	PU52801-104	Wire R	0.05
R32	QVZ1802-471	VR	470 1/8W
R33	" -222	"	2.2 K 1/8W
R34	" -223	"	22 K 1/8W
R35	PU52801-005	MFR	10 K
R36	QRH121J-1R0	FR	1.0 1/2W
⚠C 1	PU52801-105	FM Cap	0.22
⚠C 2	" -106	C Cap	0.0022
⚠C 3	" -106	"	0.0022
⚠C 4	" -105	FM Cap	0.22
C 5	QET42DM-337	E Cap	330μ/200V
C 6	" -337	"	330μ/200V
C 7	PU52801-107	"	1μ/400W
C 8	QET41HM-105	"	1μ/50V
C 9	QET41EM-227	"	220μ/25V
C10	" -226	"	22μ/25V
C11	QEE41HM-475	T Cap	4.7μ/50V
C12	QFN32EK-222	FM Cap	0.0022/250V
C13	" -222	"	0.0022/250V
C14	QET41VM-108	E Cap	1000μ/35V
C15	QFN31HK-473	FM Cap	0.047/50V
C16	" -473	"	0.047/50V
C17	QET41CM-108	E Cap	100μ/16
C18	" -108	"	100μ/16
C19	QFN31HK-224	FM Cap	0.22/50V
C20	" -333	"	0.033/50V
C21	QFN32EK-222	"	0.0022/250V
C22	" -222	"	0.0022/250V
C23	QET41HM-337	E Cap	330-μ/50V
C24	" -108	"	1000μ/50V
C25	QFN31HK-333	FM Cap	0.033/50V
C26	QET41HM-226	E Cap	22μ/50V
C27	QFN32EK-222	FM Cap	0.0022/250V
C28	QFN31HK-104	"	0.1/50V
C29	QET41EM-228	E Cap	2200μ/25V
C30	" -477	"	470μ/25V
C31	QFN31HK-224	FM Cap	470P
C32	PU52801-108	C Cap	0.0022
C33	" -106	"	0.0022
C34	" -106	"	
⚠NR 1	PU52801-014	Varistor	
⚠RY 1	PU52801-015	Relay	
⚠PTC 1	ON3105	Photo Coupler	
⚠L 1	PU52801-109	Choke Coil	
L 2	" -019	"	
L 3	" -021	"	
L 4	" -020	"	
L 5	" -017	"	
L 6	" -022	"	
L 7	" -018	"	
L 8	" -022	"	
⚠T 1	PU52801-110	Transformer	
⚠T 2	" -024	"	

Symbol No.	Part No.	Part Name	Description
P011	PU52801-025	Cap Housing	
P012	" -025	"	
P013	" -025	"	
P014	" -028	"	
	— Refer to Fig. 5-1 —		
1	PU52801-114	Insulator (2)	
2	" -111	Insulator (1)	
3	" -033	Heat Sink (2)	
4	" -032	Screw (Polycarbonate), x 2	
5	" -112	Insulator Cover	
6	" -030	Plate	
7	" -029	Heat Sink (1)	
8	PU54551	Caution Label	BARRIER
9	PU48278	Label	FUSE CAUTION
10	" -2	"	FUSE CAUTION Not Included
⚠F 1	QMF51E2-3R15	Fuse	BET3.15 A/250 AC
⚠F 2	" -5R0	"	BET5 A/250 AC
⚠F 3	" -R80	"	BET800 mA/250 AC
⚠F 4	" -2R5	"	BET2.5A/250 AC
— PC 2 Board —			
PC 2	PU52801-035	Circuit Baord	
D 1	PU52801-036	Diac	
⚠R 1	QRF101K-430		43
R 2	QRD121J-824	CR	820 K
R 3	QRD141J-683	"	68 K
R 4	" -184	"	150 K
R 5	" -100	"	10
C 1	QFN31HK-683	F Cap	0.068 50 V
⚠SCR 1	PU52801-037	Thyristor	
	PU52801-033	Radiator (2)	

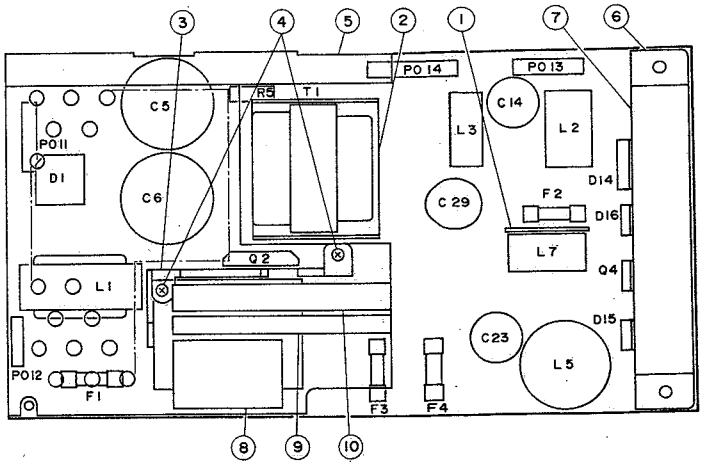


Fig. 5-1

5.2 CHG CTL Board Ass'y [0][2] PU21353B-01

Symbol No.	Part No.	Part Name	Recommended Part/ Description
IC 1	BQ-053	Integrated Circuit	
IC 2	MB4204M	"	FUJITSU
IC 3	UPD4025BC	"	NEC
IC 4	BA222	"	ROHM
IC 5	UPD4017BC	"	NEC
IC 6	UPD4528BC	"	NEC
IC 7	AN6780	"	MATSUSHITA
IC 8	"	"	MATSUSHITA
IC 9	M54519P	"	MITSUBISHI
Q 1	2SD637R	Transistor	MATSUSHITA
Q 2	"	"	MATSUSHITA
Q 3	"	"	MATSUSHITA
Q 4	"	"	MATSUSHITA
Q 5	"	"	MATSUSHITA
D 1	10E2FA-8	Diode	JAPAN INTER
D 2	"	"	JAPAN INTER
D 3	"	"	JAPAN INTER
D 4	"	"	JAPAN INTER
D 5	"	"	JAPAN INTER
D 6	—	—	
D 7	10E2FA-8	Diode	JAPAN INTER
D 8	"	"	JAPAN INTER
D 9	"	"	JAPAN INTER
D10	"	"	JAPAN INTER
D11	"	"	JAPAN INTER
D12	1S2473HE	"	ROHM
D13	"	"	ROHM
D14	"	"	ROHM
D15	"	"	ROHM
D16	"	"	ROHM
D17	"	"	ROHM
D18	—	—	
D19	—	—	
D20	U05B-F	Diode	HITACHI
D21	"	"	HITACHI
D22	"	"	HITACHI
D23	"	"	HITACHI
D24	RD12EB1	Zener Diode	NEC
D25	"	"	NEC
D26	RD6.8EB1	"	NEC
D27	"	"	NEC
D28	1S2473HE	Diode	ROHM
D29	"	"	ROHM
D30	"	"	ROHM
R 1	QRD187J-103	CR	10 K 1/8W
R 2	" -105	"	1 M 1/8W
R 3	" -273	"	27 K 1/8W
R 4	" -154	"	150 K 1/8W
R 5	" -273	"	27 K 1/8W
R 6	" -273	"	27 K 1/8W
R 7	QVZ3507-473	VR	47 K
R 8	QRD187J-273	CR	27 K 1/8W
⚠ R 9	QRZ0054-330	Fusible R	33
R10	QRD187J-123	CR	12 K 1/8W
R11	" -104	"	100 K 1/8W
R12	QVZ3507-104	VR	100 K
R13	QRD187J-103	CR	10 K 1/8W
R14	" -273	"	27 K 1/8W
R15	QVZ3507-104	VR	100 K

Symbol No.	Part No.	Part Name	Recommended Part/ Description
R16	QRD187J-473	CR	47 K 1/8W
R17	QVZ3507-103	VR	10 K
R18	QRD187J-223	CR	22 K 1/8W
R19	" -681	"	680 1/8W
R20	" -223	"	22 K 1/8W
R21	" -123	"	12 K 1/8W
R22	" -273	"	27 K 1/8W
R23	" -102	"	1 K 1/8W
R24	" -223	"	22 K 1/8W
R25	" -273	"	27 K 1/8W
R26	" -273	"	27 K 1/8W
R27	" -273	"	27 K 1/8W
R28	" -273	"	27 K 1/8W
R29	" -123	"	12 K 1/8W
R30	QVZ3507-104	VR	100 K
R31	QRD187J-273	CR	27 K 1/8W
⚠ R32	QRZ0054-330	Fusible R	33
R33	QRD187J-273	CR	27 K 1/8W
R34	" -123	"	12 K 1/8W
R35	" -103	"	10 K 1/8W
R36	" -473	"	47 K 1/8W
R37	QVZ3507-104	VR	100 K
R38	QRD187J-273	CR	27 K 1/8W
⚠ R39	QRZ0054-330	Fusible R	33
R40	QRD187J-272	CR	2.7 K 1/8W
R41	" -272	"	2.7 K 1/8W
R42	" -272	"	2.7 K 1/8W
R43	" -272	"	2.7 K 1/8W
R44	" -272	"	2.7 K 1/8W
⚠ R45	QRH019J-470M	Fusible R	47 1W
⚠ R46	" -470M	"	47 1W
⚠ R47	" -470M	"	47 1W
⚠ R48	" -470M	"	47 1W
R49	QRD187J-273	CR	27 K 1/8W
R50	" -273	"	27 K 1/8W
R51	" -102	"	1 K1/8W
⚠ R52	QRZ0054-330	Fusible R	33
R53	QRD187J-273	CR	27 K 1/8W
R54	" -273	"	27 K 1/8W
R55	" -273	"	27 K 1/8W
C 1	QFN41HK-273	My Cap	0.027 50V
C 2	QEV41CR-107	E Cap	100μ 16V
C 3	PU52802-107	"	100μ 16V
C 4	QFN41HK-273	MY Cap	0.027 50V
C 5	QET41CM-106	E Cap	10μ 16V
C 6	QFN41HK-273	MY Cap	0.027 50V
C 7	QEV41CR-107	E Cap	100 16V
C 8	" -107	"	100 16V
C 9	QFN41HK-273	MY Cap	0.027 50V
C10	QET41CM-106	E Cap	10 16V
C11	QFN41HK-273	My Cap	0.027 50V
C12	QET41CM-476	E Cap	47 16V
C13	QEV41CR-227	"	220 16V
C14	" -227	"	220 16V
C15	QFN41HK-273	MY Cap	0.027 50V
C16	" -273	"	0.027 50V
C17	" -273	"	0.027 50V
C18	QET41CM-226	E Cap	22 16V
C19	" -106	"	10 16V
C20	QFN41HK-273	MY Cap	0.027 50V
C21	QEV41CR-107	E Cap	100 16V
C22	QET41CM-336	"	33 16V
C23	QET41HM-475	"	4.7 50V

Symbol No.	Part No.	Part Name	Recommended Part/ Description
C24	QET41CM-106	E Cap	10 16V
C25	QFN41HK-273	MY Cap	0.027 50V
C26	QEV41CR-107	E Cap	100 16V
C27	QFN41HK-273	MY Cap	0.027 50V
C28	QET41CM-106	E Cap	10 16V
RY 1	PGZ01610	Relay	
RY 2	"	"	
RY 3	"	"	
RY 4	"	"	
RY 5	"	"	
P021	A75802-6	Cap. Housing	
P022	" -4	"	
P023	PU43351-3	"	
P024	" -8	"	

5.3 SW Board Ass'y [0][3] PU33489B-02

Symbol No.	Part No.	Part Name	Recommended Part/ Description
D 1	SLP-155B-81	L.E.D.	
D 2	"	"	
D 3	"	"	
D 4	"	"	
D 5	"	"	
D 6	"	"	
D 7	"	"	
D 8	"	"	
D 9	RD6.8EB1	Zener Diode	
R 1	QRD187J-681	CR	
R 2	" -222	"	
R 3	" -681	"	
	PU52800A	SW Ass'y	
	PU52848-1-2	LED Spacer	x 8
P031	PU51260-12	Cap. Housing	

5.4 BATT. Board Ass'y [0][4]..... PGE20144A

Symbol No.	Part No.	Part Name	Recommended Part/ Description
CN 1	PU43351-104	Cap Housing	
CN 2	" -104	"	
CN 3	" -104	"	
CN 4	" -104	"	

5.5 Contact Board Ass'y [0][5]..... PGE40192A

Symbol No.	Part No.	Part Name	Recommended Part/ Description
	PGD40831	Contact	x 2
	DPSP2606Z	Screw	